

Application No.: 10/028,416

## REMARKS/ARGUMENTS

### Specification

The specification has been amended to address the Examiner's objections and typographical errors. The specification has been amended to fill the blank corresponding to the U.S. Patent Application Serial numbers at page 2, lines 11 and 12. At Page 6, after line 15, the header "BRIEF DESCRIPTION OF THE DRAWINGS" has been added. Also, embedded hyperlinks on page 8 and 12 have been deleted. Applicants assert that no new matter is presented by these amendments and respectfully request entry of the same.

### Claim Objection

Claim 2, 18 and 34 have been amended to address Examiner's objections. Specifically, "comprising" has been changed to "comprises". Applicants assert that no new matter is presented by these amendments and respectfully request entry of the same.

### Claim Rejections under 35 U.S.C. 112

Claims 1, 2, 7-18, 23-34, and 39-48 have been rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite. Applicants respectfully disagree.

Claims 1, 2, 17, 18, 33, and 34 are rejected for allegedly being indefinite for reciting "adenine rich region". The specification teaches in details about the definition of adenine rich regions (for example, page 15, line 21-22). An adenine-rich region is defined as a consecutive run of at least 8, 9, 10, 12 adenines located within the last 30,

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40, 50, 60 bases of the sequence. Therefore, Applicants respectfully submit that the rejection of Claims 1, 2, 17, 18, 33 and 34 should be withdrawn.

Claims 1, 2, 17, 18, 33, and 34 are rejected for allegedly being indefinite for reciting "at the end of the sequence". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the claims to recite "at the 3' end of the sequence". Therefore, rejection of Claims 1, 2, 17, 28, 33 and 34 is obviated.

Claims 1, 2, 17, 18, 33, and 34 are rejected for allegedly being indefinite for reciting "thymine rich region". The specification teaches in details about the definition of adenine rich regions (for example, page 16, line 1-2). A thymine-rich region is defined as a consecutive run of at least 8, 9, 10, 12 thymines located within the first 30, 40, 50, 60 bases of the sequence. Therefore, Applicants respectfully submit that the rejection of Claims 1, 2, 17, 18, 33 and 34 should be withdrawn.

Claims 1, 2, 17, 18, 33, and 34 are rejected for allegedly being indefinite for reciting "at the beginning of the sequence". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the claims to recite "at the 5' end of the sequence". Therefore, this rejection of Claims 1, 2, 17, 28, 33 and 34 is obviated.

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Claims 1, 17 and 33 have been rejected for reciting "sequences derived from RNA transcript sequences". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the Claims to delete "sequences derived from RNA transcript sequences." Therefore, Applicants respectfully submits that this rejection of Claims 1, 17 and 33 is obviated.

The Office Action alleges that the boundary line for "neighboring" in Claims 1, 17 and 33 is not clearly set forth. The specification teaches that a neighborhood of up to 50 bases upstream of a polyadenylation site is searched for polyadenylation signals (for example, page 17, line 1-2). Therefore, this rejection of Claim 1, 17 and 33 should be withdrawn.

The Office Action alleges that the recitation of "the EST" in Claims 1, 17 and 33 is incomplete because there is no antecedent basis for this term. Applicants have amended Claims 1, 17 and 33 to delete "the". Therefore, this claim rejection is obviated.

Claim 1, 2, 17, 18, 33 and 34 have been rejected for allegedly being indefinite for reciting "scanning". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the Claims to recite "analyzing". Therefore, Applicants submit that this rejection of Claims 1, 2, 17, 18, 33 and 34 is obviated.

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Claims 7, 23 and 39 are rejected for allegedly being indefinite for reciting "after the block". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the Claims to recite "downstream of the block". Therefore, this claim rejection is obviated.

Claims 8, 24 and 40 are rejected for allegedly being vague and indefinite for reciting "before the polyadenylation". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the Claims to recite "5' the polyadenylation site". Therefore the claim rejection is obviated.

Claims 9, 25 and 41 are rejected for allegedly being indefinite for reciting "evaluating the probability". Applicants submit that the recited method is well known in the art and described in numerous statistical textbooks. The scope of the claims is clear to one ordinary skill in the art. Therefore, this rejection of Claims 9, 25 and 41 should be withdrawn.

Claims 9, 25 and 41 are rejected for allegedly being indefinite for reciting "before the polyadenylation site" Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the Claims to recite "5' of the polyadenylation site". Therefore, this rejection of Claims 9, 25 and 41 is obviated.

Claims 9, 10, 11, 13, 14, 25-27 and 41-43 are rejected for allegedly being indefinite and incomplete for reciting "h". The specification teaches in details about the

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definition of h (for example, see Page 17, line 10-11). The parameter h represents the position of 3'-most base of the polyadenylation signal hexamer. Therefore, Applicants respectfully submit that this rejection of Claims 9, 10, 11, 13, 14, 25-27 and 41-43 should be withdrawn.

Claims 9, 10, 11, 13, 14, 25-27 and 41-43 are rejected for allegedly being indefinite and incomplete for reciting "k". The specification teaches in details about the definition of k (for example, see Page 17, line 12-15). The parameter k represents the position of the polyadenylation signal hexamer. Therefore, Applicants respectfully submit that this rejection of Claims 9, 10, 11, 13, 14, 25-27 and 41-43 should be withdrawn.

Claims 9, 11, 25, 27, 41 and 43 are rejected for allegedly being indefinite for reciting "N". Applicants respectfully submit that the parameter N is clearly indicated in the claims as a value superior or equal to six and is told in detail in the specification (for example, see Page 17, line 7-15). Therefore, the scope of the claims is clear and this rejection should be withdrawn.

Claims 12, 28 and 44 are rejected for allegedly being indefinite for reciting "using a gamma function". Applicants submit that the recited method is well known in the art and described in numerous mathematical textbooks. The claimed method provides a statistical approach to model a particular set of data. The scope of the claims is clear to

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one ordinary skill in the art. Therefore, this rejection of Claims 12, 28 and 44 should be withdrawn.

Claims 12, 28 and 44 are rejected for allegedly being indefinite for reciting "to produce a density which places a majority of its weight on the bases". Applicants respectfully disagree. However, for the purpose of expediting the issuance of claims, Applicants have amended the Claims to recite "to produce a density distribution which places a majority of its weight on the bases" Therefore, this rejection of the Claims 12, 28 and 44 is obviated.

Claims 13, 39 and 45 are rejected for allegedly being indefinite for reciting "is modeled using a second-order Markov model trained on data collected from human 3'UTRs". Applicants submit that the recited method is well known in the art and described in numerous statistical textbooks. A Markov Model is a statistical model for sequences in which the probability of each letter depends on what letters precede it. The provided method provides algorithms that use a training set of data, collected from human 3'-untranslated regions (UTRs), to "learn" the patterns contained in that training set of data. A trained Markov Model can then be used to analyze a sequence and return a score that corresponds to how well the sequence matches the pattern. The scope of the claims is clear to one ordinary skill in the art. Therefore, this rejection of Claims 13, 39 and 45 should be withdrawn.

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Claims 14, 30 and 46 are rejected for allegedly being indefinite for reciting "wherein the first the first term ... Markovian probabilities". Applicants submit that the recited method is well known in the art and described in numerous statistical textbooks. The scope of the claims is clear to ordinary skilled in the art. Therefore, this rejection of claims 13, 39 and 45 should be withdrawn.

Claims 15, 16, 31, 32, 47 and 48 are rejected for allegedly being incomplete for reciting "base b". As taught in the specifications, e.g. page 8, lines 19-22, nucleic acid "base b" can be a pyrimidine or purine, preferably cytosine, thymine, uracil and adenine and guanine, respectively. Therefore, the scope of the claims is clear and this rejection of claims 15, 16, 31, 32, 47 and 48 should be withdrawn.

Claims 15, 31 and 47 are rejected for allegedly being vague for reciting "base b following a word w of length k is estimated by the frequency of the concatenated word (wb) divided by the frequency of the word w, where frequencies are computed from the training datasets of 3'UTRs sequences" for being vague and indefinite. The claimed method provided algorithms that use a training set of data, collected from human 3'-untranslated regions (UTRs), to determine the probability of a nucleic acid base b to follow a sequence w ("word w") of k bases ("length k"). The scope of the claims is clear to one ordinary skill in the art. Therefore, this rejection of Claims 15, 31 and 47 should be withdrawn.

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Rejection under 35 U.S.C § 102

Claims 1-6, 17-22 and 33-38 are rejected under 35 U.S.C 102(b) as allegedly being anticipated by Beaudoin et al. (2000). Applicants respectfully disagree.

For a reference to anticipate under 35 U.S.C. 102(e), "[t]here must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001, 18 USPQ2d 1896 (Fed. Cir. 1991).

Independent Claim 1, 17 and 33 are directed to a method for searching for a polyadenylation site and detecting the presence of polyadenylation signals neighboring the polyadenylation site. In contrast, Beaudoin et al. discusses patterns of variant polyadenylation signals usage in human genes. The Examiner points to the method section. However, the method section discusses how the authors surveyed dbEST database for patterns of polyadenylation signal usage. It does not disclose searching for a polyadenylation site and detecting the presence of polyadenylation signals neighboring the polyadenylation site. Because the cited reference does not disclose methods for predicting for a polyadenylation site and/or signal in a sequence, Applicants respectfully request that this rejection of Claims 1-6, 17-22 and 33-38 under 35 U.S.C. § 102 should be withdrawn.

CONCLUSION

For these reasons, Applicants believe all pending claims are now in condition for allowance. If the Examiner has any questions pertaining to this application or feels that a



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telephone conference would in any way expedite the prosecution of the application,  
please do not hesitate to call the undersigned at (408) 731-5000.

The Commissioner is hereby authorized to charge any additional fees which may  
be required, or credit any overpayment to Deposit Account 01-0431.

Applicants respectfully request that a timely Notice of Allowance be issued in this  
case.

Respectfully submitted,

By 

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